

Hammer Energy Test

Client: **Akela Ground Engineering Ltd**

Contract: **Nuneaton (23145)**

Test Date: **09/09/2024**

Pile Analysis Ref: **P2030-ET01**

Hammer Tested: **2.5 Tonne BSP JX25-8**

Report by:

G Clarke

Analyst

Dynamic Measurement and Analysis Proficiency Test: **Advanced**

Checked by:

R J Kightley

Director

Dynamic Measurement and Analysis Proficiency Test: **Master**

Date: **09/09/2024**

1. Object

To carry out a hammer energy test to a BSP JX25-8 operated by Akela Ground Engineering using a Pile Driving Analyzer with strain transducers and accelerometers recording force and velocity data.

To determine a drive system efficiency for the hammer on the BSP JX25-8.

2. Hammer Energy Test

Test Date: 09/09/2024

Contract Nuneaton (23145)

Hammer Tested: BSP JX25-8

Ram Weight: 2.5

Blow Numbers	Ram Weight (kN)	Requested Stroke (m)	Rated Energy (kN.m)	Measured Energy (kN.m)	Drive System Efficiency (%)	Blows/ Minute
14-24	24.525	0.20	5.00	5.2	104%	82.7
61-71	24.525	0.30	7.50	9.4	126%	88.9
80-90	24.525	0.40	10.00	11.4	114%	87.7

Hammer drop height was set by instrumentation from inside the piling rig.

Ram Weight (kN) calculated from Ram Mass (Tonnes) multiplied by g (9.81m/s^2).

The hammer energy test was carried out using the following equipment:

Pile Driving Analyzer: **3899L**
 Strain Transducer 1: **X810**
 Strain Transducer 2: **X811**
 Accelerometer 1: **K13100**
 Accelerometer 2: **K13095**

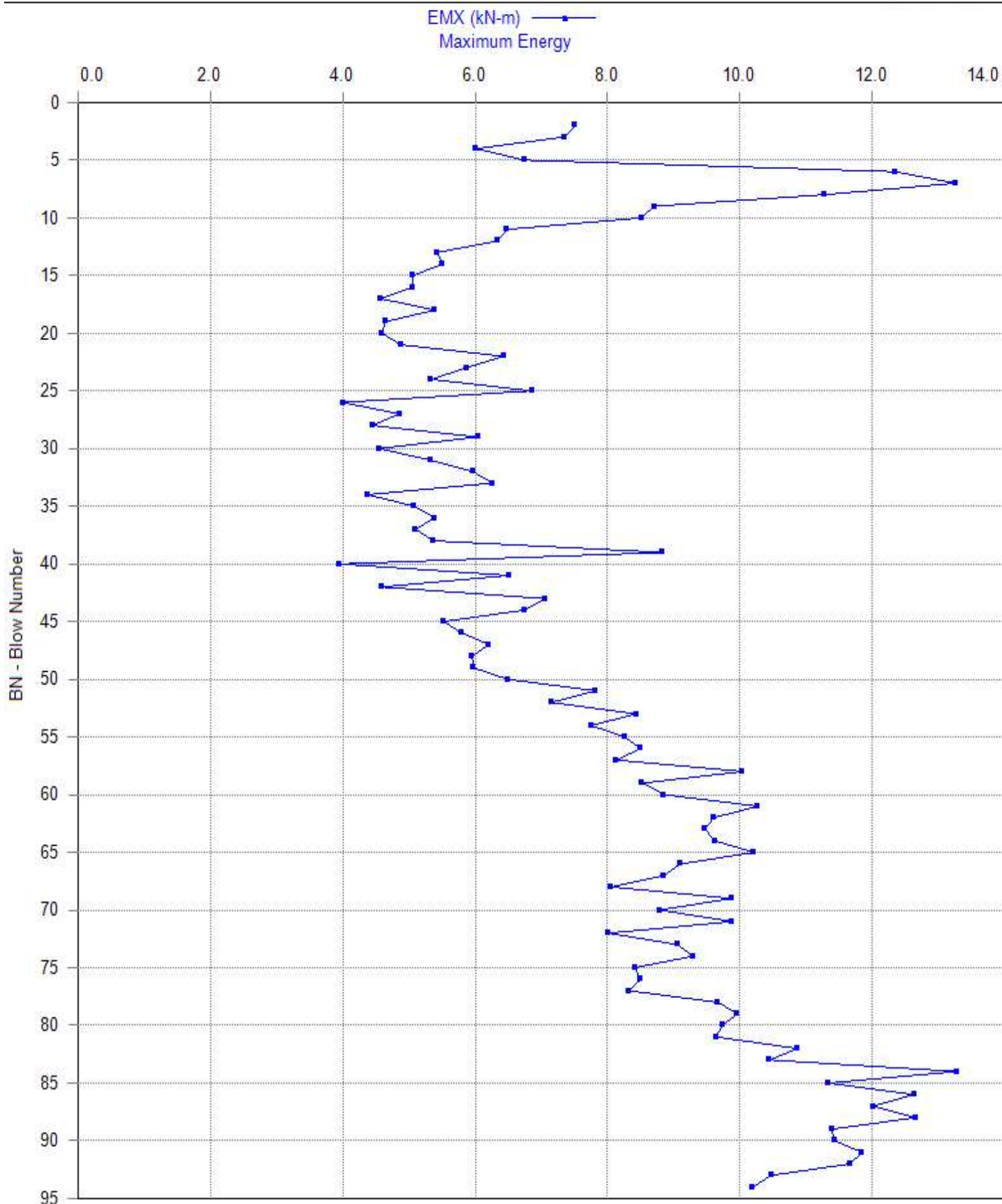
Information available at the time of test includes maximum force, velocity and energy values.

Testing was carried out with reference to ASTM D4945 Standard Test Method for High Strain Dynamic Testing of Piles.

The energy data (EMX) recorded during testing is presented in a graph and table in the following pages.



240909 NUNEATON - ENERGY TEST JX25-8





Pile Analysis Ltd

PDILOT2 2022.1.62.0

Case Method & iCAP® Results

240909 NUNEATON - ENERGY TEST JX25-8

OP: S MITCHESON

AR: 625.00cm²

LE: 6.5m

WS: 4,350.0m/s

EMX: Maximum Energy

RMX: Maximum Case Method Capacity (JC)

SFR: Skin Friction (Crude Damping Correction)

EBR: End Bearing Capacity (JC)

DFN: Final Displacement

RESTRIKE

Date: 09-September-2024

SP: 23.6kN/m³

EM: 45,466MPa

JC: 1.00

DTC: Temporary Compression

DMX: Maximum Displacement

ETR: Energy Transfer Ratio - Rated

BPM: Blows/Minute

BL#	EMX kN-m	RMX kN	SFR kN	EBR kN	DFN mm	DTC mm	DMX mm	ETR (%)	BPM bpm
2	7.5	979	271	708	1	7	8	25.5	1.9
3	7.3	990	263	727	1	7	8	25.0	50.9
4	6.0	933	206	727	1	7	7	20.4	60.7
5	6.7	972	259	713	0	7	8	22.9	83.8
6	12.3	1,082	237	845	3	8	11	42.0	80.9
7	13.3	1,101	235	866	3	8	11	45.1	82.9
8	11.3	1,105	308	797	2	8	10	38.3	87.6
9	8.7	1,045	274	771	1	8	9	29.6	92.9
10	8.5	1,040	289	751	2	7	9	28.9	85.6
11	6.5	966	215	751	1	7	8	22.0	86.4
12	6.3	955	183	772	1	7	7	21.6	82.1
13	5.4	911	154	756	0	7	7	18.5	82.6
14	5.5	914	155	759	0	7	7	18.7	78.8
15	5.1	899	113	786	0	7	7	17.2	85.3
16	5.1	890	159	731	0	7	7	17.2	84.4
17	4.6	870	89	780	0	6	6	15.5	88.1
18	5.4	914	131	784	0	7	7	18.3	79.7
19	4.6	869	110	759	0	6	6	15.8	87.7
20	4.6	862	96	767	0	6	6	15.6	89.6
21	4.9	887	92	794	0	6	7	16.6	84.9
22	6.4	958	154	804	1	7	8	21.9	73.4
23	5.9	936	141	795	0	7	7	19.9	75.7
24	5.3	912	114	798	0	7	7	18.1	82.2
25	6.9	982	184	798	1	7	8	23.3	72.7
26	4.0	825	72	753	0	6	6	13.6	96.5
27	4.9	883	98	785	0	6	7	16.5	88.7
28	4.4	856	101	755	0	6	6	15.1	93.0
29	6.0	941	143	799	0	7	7	20.5	79.1
30	4.5	866	75	791	0	6	6	15.5	89.0
31	5.3	904	112	792	0	7	7	18.1	84.1
32	6.0	940	131	810	0	7	7	20.3	76.9
33	6.3	952	153	799	1	7	8	21.3	76.3
34	4.4	851	95	756	-1	6	6	14.9	97.2
35	5.1	896	117	779	0	7	7	17.3	86.3



36	5.4	908	116	792	0	7	7	18.3	86.7
37	5.1	900	100	801	0	7	7	17.3	89.6
38	5.4	908	128	781	1	6	7	18.3	86.8
39	8.8	1,034	258	775	2	7	9	30.0	2.0
40	3.9	818	104	713	-1	6	6	13.4	83.7
41	6.5	968	173	795	0	7	8	22.1	91.3
42	4.6	862	100	762	0	6	6	15.6	87.7
43	7.1	989	201	788	1	7	8	24.0	81.9
44	6.8	977	207	770	1	7	8	23.0	75.5
45	5.5	922	136	787	0	7	7	18.8	92.4
46	5.8	932	146	786	1	7	7	19.7	94.6
47	6.2	958	135	823	1	7	8	21.1	86.1
48	6.0	940	177	764	1	7	7	20.3	97.2
49	6.0	945	123	821	0	7	7	20.3	90.9
50	6.5	964	141	823	0	7	8	22.1	92.2
51	7.8	1,019	225	794	1	7	9	26.6	89.9
52	7.2	994	184	810	1	7	8	24.3	96.4
53	8.4	1,046	233	812	1	8	9	28.7	89.7
54	7.8	1,017	180	837	1	8	8	26.4	95.3
55	8.3	1,032	215	817	1	8	9	28.1	92.4
56	8.5	1,046	244	802	1	8	9	28.9	90.6
57	8.1	1,031	232	799	1	8	9	27.7	92.8
58	10.0	1,074	330	744	2	8	10	34.1	82.9
59	8.5	1,049	224	824	1	8	9	29.0	93.7
60	8.9	1,054	227	827	1	8	9	30.1	92.9
61	10.3	1,077	299	778	2	7	10	34.9	84.6
62	9.6	1,072	287	785	2	8	9	32.6	86.5
63	9.5	1,061	255	806	2	8	10	32.2	88.4
64	9.6	1,067	251	816	2	8	10	32.7	85.5
65	10.2	1,087	327	760	2	8	10	34.7	86.1
66	9.1	1,067	251	815	2	8	9	31.0	92.8
67	8.9	1,055	173	881	2	8	9	30.1	89.8
68	8.1	1,030	156	874	1	8	9	27.4	90.9
69	9.9	1,074	317	757	2	8	10	33.6	90.6
70	8.8	1,059	281	778	1	8	9	29.9	91.5
71	9.9	1,076	261	814	2	8	10	33.6	91.3
72	8.0	1,033	115	918	1	8	9	27.2	92.7
73	9.1	1,059	204	854	2	8	9	30.8	86.5
74	9.3	1,064	236	828	2	8	9	31.6	89.3
75	8.4	1,041	135	906	1	8	9	28.6	93.7
76	8.5	1,048	227	821	1	8	9	28.9	92.1
77	8.3	1,036	158	878	1	8	9	28.3	94.0
78	9.7	1,067	267	800	2	8	10	32.9	86.1
79	10.0	1,079	327	752	2	8	10	33.9	87.8
80	9.7	1,074	314	760	2	8	10	33.1	91.3
81	9.6	1,078	321	757	1	8	10	32.8	89.6
82	10.9	1,089	345	744	2	8	10	37.0	86.4
83	10.4	1,087	360	727	2	8	10	35.5	90.0
84	13.3	1,104	385	719	4	8	12	45.2	80.9

85	11.3	1,103	369	734	2	8	11	38.6	88.8
86	12.6	1,111	375	735	3	8	11	42.9	88.9
87	12.0	1,112	378	734	3	8	11	40.8	86.7
88	12.7	1,113	399	713	3	8	11	43.0	84.4
89	11.4	1,105	380	725	2	8	11	38.7	87.1
90	11.4	1,097	347	750	2	8	11	38.9	91.0
91	11.8	1,113	374	739	3	8	11	40.3	89.2
92	11.7	1,096	357	739	3	8	11	39.7	86.3
93	10.5	1,093	270	823	2	8	10	35.6	90.2
94	10.2	1,092	319	773	2	8	10	34.7	89.6

Total number of blows analyzed: 93

Sensors

F1: [X810] 93.8 (1.00); F2: [X811] 93.4 (1.00); A1: [K13100] 436.2 (1.00);
A2: [K13095] 406.4 (1.00)



This documents that

Richard James Kightley
Pile Analysis

has on July 3, 2024 achieved the rank of

MASTER

on the **Dynamic Measurement and Analysis Proficiency Test**

The individual identified on this document demonstrated to the degree granted above an understanding of theory, data quality evaluation, interpretation and signal matching for high strain dynamic testing of deep foundations. ***It is recommended that individuals at the Basic level seek Intermediate, Advanced, Master or Expert levels through additional study within two years of the date of this document***

The ability of the individual named to provide appropriate knowledge and advice on a specific project is not implied or warranted by the Pile Driving Contractors Association or Pile Dynamics, Inc. The Pile Driving Contractors Association or Pile Dynamics, Inc. assumes no liability for foundation testing and analysis work performed by the bearer of this certificate. This certificate can be verified at www.PDAproficiencytest.com.

Frank T. Peters, Executive Director
Pile Driving Contractors Association



Garland Likins, Senior Partner
Pile Dynamics, Inc.

No. P0105



This documents that

**Graham Clarke
Pile Analysis**

has on May 17, 2024 achieved the rank of

ADVANCED

on the **Dynamic Measurement and Analysis Proficiency Test**

The individual identified on this document demonstrated to the degree granted above an understanding of theory, data quality evaluation, interpretation and signal matching for high strain dynamic testing of deep foundations. ***It is recommended that individuals at the Basic level seek Intermediate, Advanced, Master or Expert levels through additional study within two years of the date of this document***

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Frank T. Peters, Executive Director
Pile Driving Contractors Association



Garland Likins, Senior Partner
Pile Dynamics, Inc.

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